

**CLAIMS**

What is Claimed is:

- 1 1. A solid fuel air explosive, comprising:
  - 2 a first grain, wherein said first grain is a high explosive;
  - 3 a second grain, wherein said second grain is a metal fuel grain;
  - 4 about 4 to about 6 weight % of at least one binder; and
  - 5 about 14 to about 36 weight % ammonium perchlorate (AP).
- 1 2. The solid fuel air explosive of Claim 1, wherein the ratio of said second grain to said first  
2 grain is about 0.66 to about 1.45.
- 1 3. The solid fuel air explosive of Claim 1, wherein the ratio of said second grain to said first  
2 grain is about 1.
- 1 4. The solid fuel air explosive of Claim 1, wherein the said first grain comprises:
  - 2 about 87 to about 90 weight % cyclotetramethylene tetranitramine (HMX); and
  - 3 about 10 to about 13 weight % binder, wherein said binder comprises at least one of
  - 4 hydroxy-terminated polybutadienes (HTPB), hydroxy-terminated polycaprolactone (PCP),
  - 5 hydroxy-terminated polyesters, hydroxy-terminated polyethers (HTPE), glycidyl azide
  - 6 polymer (GAP), lauryl methacrylate (LMA) and trifluoroethyl-terminated poly (1-cyano-1-

7 difluoramino)-polyethylene glycol (PCDE).

1 5. The solid fuel air explosive of Claim 1, wherein said metal fuel grain comprises at least one of  
2 reactive metal and metal composite.

1 6. The solid fuel air explosive of Claim 5, wherein said reactive metal comprises at least one of  
2 nano-sized metal particles, metastable mechanical alloy and any combination thereof.

1 7. The solid fuel air explosive of Claim 5, wherein said reactive metal comprises at least one of  
2 nano-sized aluminum, nano-sized boron and nano-sized titanium, nano-sized magnesium, Al-  
3 Mg, Al-Mg-H, B-Mg, Al-B, Ti-B, Ti, B, Mg and H-2 and H-5.

1 8. The solid fuel air explosive of Claim 6, wherein said nano-sized metal particles including an  
2 average particle size of about 200 nm to about 500 nm.